

Opinion Piece

Spare a thought for the losers

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When I travel I sometimes feel like a visitor from a Green planet.

My home state, Tasmania, has 40% of its land area (including 40% of its forested area) in formal conservation reserves. Almost all of that reserved land, seen with overseas eyes, is in good, 'natural' condition, and there are very large areas of 'natural' bush in non-reserved Tasmania as well. I am particularly pleased with the 'naturalness' of our invertebrate fauna. Very few invaders (so far) have done well on our island. If I pick a spot at random on the map of Tasmania and sample its invertebrates, it is likely that nearly everything I collect will be indigenous, and a large proportion will be Tasmanian endemics.

Not many of the places I visit overseas (or for that matter, on the Australian mainland) are similarly Green. Landscapes with Tasmania's temperate climate are typically packed with farms and cities. The settled habitats in such places are zoologically not very diverse, and the 'wild' bits are small, scattered and teeming with animal weeds. Reserves include popular fishing and picnicking spots. To city dwellers with access to those reserves, 'natural' simply means 'non-urban'.

What was it like in these places before they were intensively settled? You can often get a naturalist's overview by reading the accounts of early travelers. Sometimes these accounts are heartbreaking. Huge areas of what must have been zoologically diverse habitat, rich in local endemics, are farmland today, or suburban sprawls. And more often than not, I suspect, the disappeared native invertebrates have left no trace whatsoever of their existence. No pinned or pickled specimens, no cave or bog subfossils. Nothing at all.

These animals were losers that did not make it through the latest extinction crisis. They also did not make it into museums, which are the natural habitat of the extinct. No one is ever going to add them to a database of biodiversity, global or otherwise. They are the missing branches in cladograms, the missing bits of codes in genetic libraries and the missing pieces in biogeographical jigsaw puzzles.

Much of what we think of today as fauna conservation is aimed at preventing such loss. Many readers of *Australian Zoologist* have been working for years to get more reserves, to get more fauna-friendly off-reserve management, to increase environmental streamflows, to reduce pollution and to prevent the establishment and further spread of invasives. We have also worked hard at recognising which species are threatened and at finding ways to ameliorate the threats.

But losses have undoubtedly occurred while we worked. They are still occurring and will continue to occur. Why? Because in fauna conservation we are practising *triage* (New 1991). There is not enough money, time and enthusiasm

to save every living Australian animal through a strategy of preventing loss. Some must be allowed to go. Perhaps we should insert a qualifying clause in section 4.1.5 of the *National Strategy for the Conservation of Australia's Biological Diversity*: 'The completion of a comprehensive inventory of Australia's ecosystems, *i.e. of the ones we can get to before they disappear*, should be treated as a matter of urgency in research funding' (italics added).

I think it is time we thought a bit more about the losers, the animals that are not going to be with us much longer. Let us accept that species and genetically distinctive populations are going extinct, and let us salvage some specimens before they do. We will not be the first to think this way, even in Australia. Eighty-odd years ago, Baldwin Spencer had a very clear vision of what this country was losing:

'...the land and fresh-water fauna is disappearing rapidly, and unless we now make an organized effort it will be too late to study it effectually, and future generations will wonder what manner of people we were not to leave behind us some adequate record of the marvellously interesting forms of animal life which we had succeeded in exterminating...' (Spencer 1921).

There is a difference between Spencer's call for a comprehensive inventory and the one in the *National Strategy*. Spencer spoke from personal experience of the wet forests close to Melbourne, which he saw being cleared or severely degraded in his own lifetime. It was places like these that he wanted inventoried: the places where fauna was disappearing. This emphasis is missing not only from the *National Strategy*, but seemingly from every other conservation document produced since the Rio summit of 1992. Governments seem agreed that documenting biodiversity is a good idea. They seem reluctant to think about where the job needs doing most urgently.

It is an interesting reluctance. If you want to sample and document biodiversity before it disappears, you might want to argue about which faunal groups should have priority in collecting, but there can be very little argument about where animals are vanishing fastest. On a global scale you can see it on satellite images. On a regional scale it is obvious on maps and aerial photographs. In Australia, the places in which to salvage vanishing species are 'useless bits of scrub' in intensively farmed areas, and those 'development opportunities' so beloved of shire councils, close to towns and cities.

It would be fairly easy, too, to prioritise this kind of salvage. The smaller and more isolated the remnant, the less sampled its surround, and the closer the bulldozer, the greater the need for salvage sampling.

Which brings me back to Green and pleasant Tasmania. In 1994 for the Australian Heritage Commission, and in 1996 for the Regional Forest Agreement process, I compiled databases of locality records of Tasmanian non-marine invertebrates. The records came from a wide range of publications and from databases maintained by museums and private individuals, i.e. taxonomic specialists, who provided records on the condition that the data remained confidential. When I plotted the records on a map I discovered something extraordinary. The vast majority of records for named species were from wilderness and from roaded but heavily forested areas. The one-kilometre square surrounding Pelion Hut in the Cradle Mountain Lake St Clair National Park had the highest recorded invertebrate species richness of any one-kilometre square in Tasmania (Mesibov 1996). (The square just to its east had no recorded species at all.)

The 'pull of the remote' has been very strong in Tasmania. Our alpine and wild western regions have drawn individual zoologists (and ambitious zoological sampling programs) for many years. Today, the places with the best known faunas are the most remote and best-conserved in the State. Yet for nearly a century (Smith 1909) zoologists have known that Tasmania's fauna is strongly regionalised, and that the west and east have different terrestrial and freshwater assemblages. Prior to European settlement, Tasmanian faunal diversity extended from coast to coast. There were geographically restricted and evolutionarily interesting taxa in every part of the island. We know much less about species in settled parts of Tasmania because we have not searched there as hard as we have in the wilderness.

In unpublished (and unfunded) work in 1999, I had a GIS-based look at Tasmania's native vegetation remnants, using another of the spatial data sets compiled for the Regional Forest Agreement. The analysis identified 148 remnants which were more than 10 km from any aquatic invertebrate locality record and 10 remnants more than 10 km from any terrestrial invertebrate record. Many of the remnants were less than 75 km from Hobart, Tasmania's biggest city. Two of the three highest-priority remnants (furthest from any known collections) were within 25 km of the city centre. The largest data gaps in invertebrate recording were in areas where habitat fragmentation had created numerous small, isolated patches of remnant bush.

Putting it another way, the places where the bush is most fragmented and most at risk of further loss and degradation are the places whose invertebrate fauna is least known. My Green Tasmania badly needs salvage sampling.

The sampling would not simply be a search for species on the brink, although there are certainly indications that some would be found. Among the named land snails, *Miselaoma weldii* is restricted to 4 ha near the northwest coastal village of Stanley (Bonham 1999), *Pasmaditta jungermanniae* is now only found in Cataract Gorge in Launceston (Bonham 2003), and *Discocharopa vicens* seems to be disappearing over its small range in degraded, over-burned dry forest in Hobart's eastern suburbs (Bonham 2003).

Salvage sampling would also reveal more of the remarkable biogeographical patterning in Tasmania that has become apparent in recent years (Mesibov 1996),

notably the sharp and sometimes inexplicable boundaries between species and faunal assemblages (Mesibov 1997, 1999, 2003). We can expect surprises, as well, from the incidental sampling of genetic variation within species. Although the formerly 'Vulnerable' land snail *Anoglypta launcestonensis* has been removed from Tasmania's threatened species list because the species no longer satisfies the formal criteria for 'threatened', sympatric shell variants have been noted, and four of the known shell variants are clustered in a small area on and around Blue Tier in Tasmania's Northeast (Bonham 1996).

In an unofficial way, I often do salvage sampling on private land in Tasmania in my attempts to delimit the species ranges of millipedes and other litter invertebrates. There are some advantages to collecting on private land. I do not need a permit from the conservation bureaucracy, and I am only rarely asked to make recommendations on land management (something I cannot do with confidence). Interestingly, in 30 years of knocking on farmer's doors and asking for permission to collect bugs, I have never had a refusal. Private landowners are almost always interested in what I am doing and are often keen to see what I catch. Tasmania might be an unusually friendly part of Australia, but I find it hard to imagine that disappearing habitats on the mainland are surrounded by razor-wire fences and guarded by armed anti-zoology forces. The chief obstacle to salvage sampling is a shortage of time, money and skilled personnel, not opposition from owners of land to be salvaged.

This is not the place to formally propose a strategy for salvage sampling, although one has recently been outlined for Tasmanian forest areas as an alternative to sampling of forest species already known to be threatened (Mesibov *et al.* 2002). What I wanted to do in writing this opinion piece was make a case for the idea of salvage sampling. I believe we should try to recover at least some of the specimens and biogeographical information that will otherwise be irretrievably lost as Australia continues to develop at the expense of its natural environment. Salvage sampling is not unlike archaeological salvage, as carried out in conjunction with roadworks and new building construction. The aim of archaeological salvage is not to find reasons to stop development, but simply to recover or document elements of our historical heritage before they are destroyed. The aim of zoological salvage is to recover or document elements of our natural heritage before they disappear.

Many of the readers of *Australian Zoologist* are vertebrate specialists, and this opinion piece has largely been an invertebrate rant. I will finish with a vertebrate story. On 7th July 1830, George Robinson, an amateur naturalist and the man hired by the colonial government to round up the last Aboriginal Tasmanians, was on Perkins Island, close to Duck Bay in far northwest Tasmania. Robinson wrote in his diary:

'Saw a small animal resembling a mouse with two strong feathers as a tail, and wings. It flew close to the ground for a distance of five or six yards, then dropped in among the grass. I tried to catch it but was unable.' (Plomley 1966: 186)

Perkins Island probably carried some grassy woodland in 1830. After more than 150 years of grazing and burning, the island today has few trees and is largely covered with pasture and dune scrubs. There are no feathertail gliders

on the island, nor have feathertail gliders ever been recorded on the Tasmanian mainland. If Tasmania once had gliders, as Robinson's note suggests, they are gone now, without a trace. No specimens were salvaged.

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